placed on the end user common line ("EUCL") charge, or SLC, and permit incumbent LECs like Pacific Bell to deaverage SLCs geographically. The current usage sensitive CCL charges levied against IXCs constitute an inefficient "tax" on long distance calling. Moreover, geographically uniform SLCs in the face of large geographic differences in loop costs are inherently discriminatory and thereby unsustainable in a competitive environment.

To the extent the Commission requires that IXCs continue to subsidize end users by paying for common line costs through exchange access charges, the IXCs' payments should be assessed against some measure of retail purchases, that is, bulk billed. Bulk billing corresponds more closely to a retail tax and would thereby improve productive efficiency. The economically preferred method of bulk billing is to assess IXCs on the basis of presubscribed lines rather than interstate revenues. LECs incur loop costs when households and businesses decide to subscribe to telephone service, and these costs do not vary with their subsequent usage. Thus, assessing IXCs on the basis of presubscribed lines coincides with how LECs incur loop costs.

Economic efficiency requires that prices reflect the manner in which suppliers incur the costs of producing goods and services. Not only should price levels be high enough to cover incremental costs but price structures should also match cost structures.[3] Common line costs are properly attributable to the services which cause them to be incurred—private line, special access, Centrex and the subscriber access component of basic local exchange service. Common line costs are appropriately recovered from such services and not from long distance and switched access. Even if one incorrectly believes that common line costs are true common costs, these costs are undeniably nontraffic sensitive ("NTS"). If feasible, NTS costs should be recovered through flat rates, not usage sensitive charges. Traffic (or

[3] Roger Sherman, *The Regulation of Monopoly* (New York: Cambridge University Press, 1989.), pp. 111-115.

usage) sensitive charges like the current CCLC should be used to recover traffic sensitive costs.[4]

Loop costs also differ widely with differences in geography. These geographic differences include customer density, terrain, depth of bedrock and water tables, and urban congestion. Most importantly, loop costs vary greatly with customer density; the greater the number of subscribers per square mile, the lower are loop costs per line. Uniform SLCs in the face of such disparity discriminate against customers in denser, less costly areas and give IXCs a strong uneconomic incentive to build competing local exchange facilities in those areas. In addition, as required by the Act, Pacific Bell will geographically deaverage its rates for unbundled loops. Pacific Bell's unbundled loop rates are lower where customer density is higher. Deaveraged rates for unbundled loops render potential entrants' attraction to dense exchanges even stronger. This attraction is further strengthened by the fact that customer density tends to coincide with revenue concentration; high volume users tend to reside in dense exchanges. As a result, incumbent LECs like Pacific Bell are extremely vulnerable to competitive inroads if uniform SLCs remain mandatory. Pacific Bell and other incumbent LECs will lose many of their most profitable customers; while their public service obligations mean that they must continue to serve the least profitable and the unprofitable.

Insofar as interstate services must continue paying for CCL costs, the associated exchange access charges should have two key features. First, CCL charges should be assessed as closely as possible to the end user. A CCL charge is equivalent to a tax on long distance services. While all taxes distort efficient outcomes, taxes applied at upstream stages in a vertical chain of production are particularly distorting. Exchange access is essentially an input into the production of long distance services; therefore, it is useful to think of LECs as standing upstream in a vertical chain. Assessing CCL charges against

[4] With permission of the author, this paragraph borrows liberally from Steve G. Parsons, "The Economic Necessity of an Increased Subscriber Line Charge (SLC) in Telecommunications," *Administrative Law Review*, Vol. 48, No. 2, (Spring 1996), pp. 235-236.

IXCs essentially "taxes" telecommunications services twice, once when levied by the upstream LECs and again when passed along in the retail prices of the downstream IXCs.

Double taxation in a vertical chain of production is a well-known problem in public economics. Efficiency in production dictates that governments apply commodity taxes such as the CCL charge as close to the final stage of production as possible; that is, at the retail level.[5] Thus, in the interest of productive efficiency, the Commission should allow LECs to levy CCL charges against some measure of retail purchases, such as IXCs' shares of presubscribed lines or interstate revenues.

Second, CCL charges should have a flat rate structure corresponding to the way LECs incur loop costs. In other words, the associated charges should not constitute a disguised means of assessing interstate services on the basis of usage. To repeat, costs that do not vary with usage should not be recovered through usage sensitive charges, and loop costs are unrelated to usage. Therefore, the Commission should allow LECs to assess CCL charges on the basis of IXCs' share of presubscribed lines rather than interstate revenues. Basing CCL charges on presubscribed lines breaks the link with usage and corresponds more closely to how LECs incur loop costs.

B. Local Switching: Multi-Part Tariffs

Section III also solicits comments on two fundamental proposals for restructuring local switching rates. First, Section III notes that a combination of flat rates and usage sensitive charges for local switching may better reflect cost causation principles.[6] Second, Section III requests comment on prescribing separate access charges for the initial and subsequent periods of a call.[7] In effect, Section III is asking whether a multi-part schedule for local switching rate elements would improve efficiency, and the answer is yes. Multi-

[5] P. A. Diamond and J. A. Mirrlees, "Optimal Taxation and Public Production, I: Production Efficiency," *American Economic Review*, Vol. 61 (March 1971), pp. 8-27.

[6] NPRM, ¶¶ 72 and 73.

[7] NPRM, ¶ 76.

part rate schedules often track more precisely the incremental costs of a service having various dimensions, such as in the provision of electricity,[8] and multi-part tariffs for local switching are no exception.

C. Local Switching: Two-Part Tariffs for Connection and Usage

Again, I agree with the reasoning set out in the Section III regarding a combination of flat rates and usage sensitive charges for local switching. Economists refer to such a combination as a two-part tariff, a special case of multi-part tariffs. In my opinion, Section III correctly supposes that connection to the local switch and traffic traversing the switch (usage) are two different cost parameters of local switching service. Other economists besides myself have investigated the structure of production costs in telecommunications and reached similar conclusions. For example, Professor Roger Sherman of the University of Virginia concludes that in telephone service: "Connection and usage are then two causes that warrant separate charges."[9]

The incremental costs of local switching vary with both the number of connections to the switch and the traffic going across those connections. The incremental costs of switch connections (ports and line cards) do not vary with usage, but the incremental costs of switch usage vary with the amount of traffic traversing the switch. Thus, establishing a two-part tariff for local switching would improve economic efficiency. Local switching charges consisting of a flat rate for connections and a variable rate for usage would reflect more accurately the variation in incremental costs.

D. Local Switching: Call-Setup Charges

Establishing separate usage sensitive charges would also represent a two-part tariff. Like separate charges for switch connection and usage, a fixed and a variable charge for switch usage more accurately reflect the incremental costs of local switching. Each long

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[8] William Vickrey, "Some Objections to Marginal-Cost Pricing," in Richard Arnott *et. al.*, (eds.) *Public Economics: Selected Papers by William Vickrey* (New York: Cambridge University Press, 1994), p. 218.

[9] Sherman, *op. cit.*, p. 111.

distance call imposes costs that are independent of duration, distance, time of day or day of the week. These costs result from establishing and keeping open a network path. Thus, a two-part tariff consisting of a fixed charge per message and a variable charge per minute more closely conforms to the structure of local switching costs.

E. Local Transport: Charging Direct-Trunked Transport Customers for Tandem-Switched Transport Capacity

The final area of my comments regarding rate structure modifications concerns recovering tandem switching costs in charges for direct-trunked transport.[10] Pacific Bell and other incumbent LECs provide direct-trunked transport customers the ability to redirect overflow traffic over tandem-switched routes. It is my understanding that the nature of overflow traffic is essentially random; that is, its occurrence is uncertain. Uncertain direct-trunked overflows require that Pacific Bell and other incumbent LECs maintain sufficient capacity to meet tandem-switched transport demands at peak periods plus a security margin for the overflow traffic. This security margin is necessary to avoid interruptions in the service provided tandem-switched transport customers or, in the alternative, blocking direct-trunked transport customers' overflow traffic. On efficiency grounds, customers with random demands should pay for the extra cost incurred due to the uncertain nature of their capacity requirements.[11] Thus, direct-trunked transport customers should be assessed a standby charge reflecting the added cost of accommodating their overflow traffic.

III. CRITERIA FOR RELAXING OR REMOVING ACCESS PRICING CONSTRAINTS

Sections IV and V of the NPRM propose two different sets of criteria for relaxing or removing the regulatory controls governing interstate access rates. Both sections advance criteria aimed at testing the effectiveness of competition.[12] Calling them

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[10] NPRM, ¶ 90.

[11] Louis Phlips, *The Economics of Price Discrimination* (New York: Cambridge University Press, 1983), pp. 141-143.

[12] NPRM, ¶¶ 149 and 161.

"competitive factors," Section IV suggests a single set of four criteria consisting of three structural tests and a single behavioral test.[13] In contrast, Section V proposes to deregulate access charges in two phases using two sets of criteria.[14] Referring to barriers to competitive entry, Phase 1 advances a long list of criteria apparently aimed at assessing the strength of *potential* competition and resting on three performance tests and several open access standards.[15] Phase 2's criteria seem intended to gauge the extent of *actual* competition and resort also to structural tests as well as achieving universal service reform objectives and regulatory enforcement standards.[16]

The Commission need not rely upon the many competitive tests set out in Sections IV and V to permit flexible pricing of interstate access services. Most of the competitive tests set out in these two sections are unnecessary, misleading and unduly burdensome. The key to securing effective competition in access services is overcoming the entry-deterring effect of the substantial sunk costs associated with local exchange facilities. Consequently, the attainment of open access to local networks constitutes the relevant test of competitiveness. In terms of Section IV's competitive factors, the relevant test is the success of the Act's open access provisions in increasing the elasticity of supply of access services. Voluntary negotiations and arbitration proceedings under the auspices of the California Public Utilities Commission ("CPUC") have already culminated in eighteen interconnection arrangements between Pacific Bell and competitive local exchange companies ("CLECs"). The Commission should allow the implementation of these arrangements to bring effective competition to access services and not resort to additional tests and standards.

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[13] NPRM, ¶¶ 150, 156-159.

[14] NPRM, ¶ 161.

[15] NPRM, ¶¶ 163, 170 and 173-175.

[16] NPRM, ¶¶ 164 and 202-207.

A. Structural Tests

Translated into economic terms, the first three competitive factors mentioned in Section IV of the NPRM are elements of market structure. Market structure refers to "... those characteristics of the organization of a market that seem to exercise a strategic influence on the nature of competition and pricing within the market."[17] The three structural factors discussed in Section IV are market share, market demand elasticity and the elasticity of market supply. Economists and antitrust scholars have advocated using these three factors in combination to assess the degree of market power in antitrust cases.[18]

The Commission would make a serious mistake if it made pricing flexibility for access services contingent upon either market share or market demand elasticity. Market share is an unreliable indicator of market power. Market demand elasticity indicates only whether control over price may produce economically harmful results, not whether appreciable market power is present or absent. Many vigorously competitive markets, particularly in staple agricultural commodities, are characterized by very inelastic demand.

In contrast, supply elasticity is a more reliable indicator of market power. Supply elasticity measures the ease of entry and competitive expansion, but constructing elaborate tests of entry barriers affecting exchange access is not necessary. Congress has already established open access standards in the Act which have substantially lowered entry barriers into the local exchange; that is, which have significantly increased the supply elasticity of access services. Thus, progress toward attaining full implementation of these standards constitutes a reasonable test of competitiveness in exchange access services.

Without an examination of other factors, market share is a misleading indicator of market power, especially for regulated firms. A leading textbook in industrial organization economics explains:

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[17] Joe S. Bain, *Industrial Organization* (New York: Wiley, 1968), p. 7.

[18] William M. Landes and Richard A. Posner, "Market Power in Antitrust Cases," *Harvard Law Review*, Vol. 94, No. 5, (March 1981), pp. 937-996.

> Market shares alone are not completely determinative of whether a firm has market power, and additional analysis of the economic conditions is necessary before one can reach a conclusion about market power. For example, if entry is easy, then the industry pricing will be severely constrained, regardless of whether one firm currently has a large market share.[19]

Reliance on market share as an indicator of market power is particularly troublesome in regulated markets wherein (1) prices may be maintained below efficient levels, and (2) entry or exit restrictions are in place. The same scholars who have advocated using market share and demand and supply elasticities in antitrust cases warn that their analysis is inappropriate in regulated industries:

> "To the extent that regulation is effective, its effect is to sever market power from market share and thus render our analysis inapplicable. . . Regulation may increase a firm's market share in circumstances where only the appearance and not the reality of monopoly power is created thereby."[20]

In summary, a large market share is not only an insufficient test of market power, but in regulated industries it is also an irrelevant test.

Whatever the degree of control conferred by a large market share, such control cannot be lasting and important unless protected by barriers to entry. A barrier to entry may be defined as a cost that potential entrant firms will incur entering an industry but need not be borne by established sellers.[21] Barriers to entry primarily come in two forms—artificial and natural. Artificial entry barriers are creatures of government: occupational licensure, exclusive franchises, patents, copyrights and trademark protection. Section 253 of the Act has removed the artificial entry barriers that once protected Pacific Bell and other incumbent LECs.

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[19] Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization* (Glenview, Ill.: Scott, Foresman, 1990), p. 739.

[20] William M. Landes and Richard A. Posner. "Market Power in Antitrust Cases," *Harvard Law Review*, Vol. 94 (March 1981), pp. 975-976.

[21] George J. Stigler, *The Organization of Industry* (Chicago: University of Chicago Press, 1968), p. 67.

Natural entry barriers include sunk costs. Sunk costs arise from asset specificity. Asset specificity means that some of the investment costs of entering a market may not be recoverable except with considerable loss or after considerable delay. Sunk costs are especially likely to be a source of entry barriers in industries that require substantial investments in non-redeployable assets, such as local exchange facilities, and are subject to economies of scale or scope.[22] Given the role of sunk costs in producing entry barriers, the relevant inquiry concerning pricing flexibility for exchange access services is the openness of access achieved through voluntary negotiations and compulsory state arbitration under the Act.

B. Behavioral Tests

Section IV contains the single behavioral test of competition proposed in the NPRM.[23] This test proposes that the Commission rely upon evidence that an incumbent LEC has priced its access services below the level permitted by the federal price cap ceiling. Such a test of competitive behavior is potentially misleading. The relevant economic test is pricing at or near the competitive level, not pricing below some administratively determined ceiling like a price cap. The cap may be higher or lower than the rate that would prevail in a competitive market. Even a properly formulated behavioral test of the rate that would prevail under competition is impractical. In a multi-product industry subject to economies of scale and scope like telecommunications, determining the competitive level depends upon having rare and costly information on individual firm demand elasticities.

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[22] For an explanation of how sunk costs may deter entry, see Daniel F. Spulber, "Deregulating Telecommunications," *Yale Journal on Regulation*, Vol. 12 (1995), p. 45.

[23] NPRM, ¶ 159.

IV. MARKET-BASED APPROACH TO ACCESS REFORM

A. Performance Tests

The first three of the eight Phase 1 criteria proffered in the NPRM's Section V also constitute impractical and potentially dangerous measures of competitiveness. These three tests are (1) unbundled element prices based on economic costs, (2) transport and termination charges based on additional costs, and (3) wholesale prices based on reasonably avoidable costs. The cost-price relationships implicit in these criteria represent a part of the efficiency dimensions of market performance. Market performance refers to the end results produced by the firms in a market and may be measured in several dimensions.[24] The father of industrial organization economics, Professor Edward S. Mason of Harvard University, long ago warned of the impracticality of performance tests:

> No one familiar with the statistical and other material pertaining to the business performance of firms and industries would deny the extreme difficulty of constructing from this material a watertight case for or against the performance of particular firms in particular industries.[25]

Likewise, industrial organization economist and former Michigan State University President Walter Adams warns of the dangers of employing performance tests:

> *Application of the performance standard, in a court of law or before an administrative tribunal, affords unusual opportunities for dilatory tactics and stratagems of confusion.* It opens a Pandora's box of procedural obstructionism which is conducive neither to the scientific use of economic evidence nor to the expeditious determination of the issues in the light of such evidence. Given the inexactness of economic knowledge, even the more "objective" components of performance—such

[24] Bain, *op. cit.*, pp. 10-11 and 373-376.

[25] Edward S. Mason, "The Current Status of the Monopoly Problem in the United States" in Richard B. Heflebower and George W. Stocking (eds.), *Readings in Industrial Organization and Public Policy* (Homewood, Ill.: Irwin, 1958), p. 390.

> as profit levels—can be the subject of seemingly endless and inconclusive wrangling.[26]

The Commission should heed the warnings of these two distinguished economists when it comes to testing the vigor of competition for access services with price-cost margins. Prices in excess of incremental cost are not ruled out for firms in industries characterized by substantial economies of scale and scope, yet such industries may be vigorously competitive in the sense of being contestable. However, the price-cost margins in contestable markets will be no higher than necessary to maintain the long-run financial health of the firms in the industry.[27]

Four facts pertinent to this proceeding emerge from the theory of contestable markets. First, incumbent LECs like Pacific Bell are subject to important economies of scale and scope.[28] Second, economies of scale and scope in local telecommunications produce significant shared and common costs.[29] These shared and common costs must be recovered by prices in excess of incremental costs. Third, prices exceeding incremental costs are not ruled out in contestable markets even if the prices involved are for intermediate goods and services. Intermediate goods are inputs used in downstream production processes, and in telecommunications, incumbent LECs' exchange access services, unbundled network elements and other interconnection services are intermediate goods. Finally, the open access standards established in the Act are meant to overcome the

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[26] Walter Adams, "The Case for Structural Tests" in James W. Brock and Kenneth G. Elzinga (eds.), *Antitrust, the Market, and the State: The Contributions of Walter Adams* (Armonk, NY: M. E. Sharpe, 1991), p. 163 (emphasis in the original).

[27] Elizabeth E. Bailey and William J. Baumol, "Deregulation and the Theory of Contestable Markets," *Yale Journal on Regulation*, Vol. 1 (1984), pp. 121-122.

[28] Almarin Phillips, "The Reintegration of Telecommunications: An Interim View," in Michael A. Crew (ed.) *Analyzing the Impact of Regulatory Change in Public Utilities* (Lexington, MA: Lexington Books, 1985), p 8. See also Surrebuttal Testimony of William J. Baumol, Before the Public Service Commission of the State of Missouri, Case Nos. TO-84-223, TO-85-126 and TO-85-130, *et. al.*, October 23, 1985, pp. 11-12.

[29] Alfred E. Kahn and William B. Shew, "Current Issues in Telecommunications Regulation: Pricing," *Yale Journal on Regulation*, (1987) , reprinted in Alexander C. Larson and Mark E. Meitzen (eds.) *Cost and Pricing Principles for Telecommunications: An Anthology* (Washington, D.C.: United States Telephone Association, 1990), p. 56. See also Hunt, L.C. and E.L. Lynk, "Divestiture of Telecommunications in the UK: A Time Series Analysis," *Oxford Bulletin of Economics and Statistics*, Vol. 52 No. 3 (Aug. 1990), p. 244.

entry barriers stemming from the combination of scale and scope economies and heavy sunk costs.

B. Open Access Standards

The Act has already substantially lessened the impact that sunk costs might have on the condition of entry into the local exchange. The Act's provisions regarding open access greatly facilitate entry into the local exchange segment of the industry. These open access provisions include compulsory interconnection, collocation, unbundling, and resale. Reciprocal interconnection for the purpose of terminating local traffic allows customers of new entrants to reach and be reached by the incumbent's customers. Unbundled loops, local switching, and transport give newcomers easy access to the incumbent's existing customers. Collocation, resale, and access to rights-of-way further ease entry by overcoming any necessity to sink costs in duplicate facilities. In combination, the Act's open access provisions have significantly reduced or eliminated entry barriers associated with heavy sunk costs.

Consistent with the policy implications of contestable market theory, the Act attempts to reduce any entry barriers that might arise from sunk network facilities by giving potential competitors open access.[30] Under the Act, establishing open access has involved imposing certain duties and obligations and relying on voluntary negotiations and arbitration by the various state regulatory commissions. In the case of Pacific Bell, that process has produced interconnection arrangements satisfying the Act's 14-point competitive checklist. Pacific Bell's significant progress toward opening up its network strongly suggests that the following two-phase open access test is reasonable: (1)

[30] Bailey and Baumol, *op. cit.*, p. 124. See also Elizabeth E. Bailey, "Deregulation of Contestable Markets: Application of Theory to Public Policy," in Thomas G. Gies and Werner Sichel (eds.), *Deregulation: Appraisal Before the Fact* (Graduate School of Business Administration, University of Michigan , 1982), p. 4, and Paul W. MacAvoy, Daniel F. Spulber and Bruce E. Stangle, "Is Competitive Entry Free? Bypass and Partial Deregulation in Natural Gas Markets," *Yale Journal on Regulation*, Vol. 6, No. 2 (Summer 1989), pp. 222-223.

interconnection arrangements are in place and (2) CLECs are using the unbundled network elements and other interconnection services available under these arrangements.

Pacific Bell has already met the first phase of the foregoing open access test. According to information supplied by Pacific Bell, it has completed eighteen local interconnection contracts with CLECs through voluntary negotiation and compulsory arbitration. Several of the agreements meet the 14-point competitive checklist contained in Section 271 of the Act. Two contracts have been the subject of mandatory arbitration before the CPUC. On the basis of this information, it seems reasonable to conclude that the Act's various open access provisions are achieving their purpose.

C. Regulation of Terminating Access

Section VIII cites arguments asserting that LECs exert greater market power over terminating access service than over originating access and suggests that this greater power may justify differences in regulatory treatment.[31] There is no firm factual foundation for believing that LECs hold greater market power over terminating access; therefore, the differences in regulatory treatment considered in this section are unjustified.

The purported factual basis noted in Section VIII appears to rest on what economists refer to as the call externality. Externalities occur when persons who are not parties to a transaction receive benefits or incur costs as a result of that transaction. Professor Lester D. Taylor of the University of Arizona explains: ". . . a completed call necessarily impinges on a second party, and an externality is thereby created."[32] In other words, the recipient of a telephone call benefits from the call even though the recipient is not a party to the transaction between the caller and the carrier.[33]

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[31] NPRM, ¶¶ 271-276.

[32] Lester D. Taylor, *Telecommunications Demand: A Survey and Critique* (Cambridge, MA: Ballinger, 1980), pp. 15-16.

[33] With 800 calls, the caller benefits even though the caller is not a party to the transaction between the recipient and the carrier.

The NPRM's apparent concern over call externalities is misplaced. Call externalities do not impart appreciable differences in market power over originating and terminating access. The reason is that the calling and called parties usually internalize the external benefits. Professor John R. Meyer of Harvard University and his colleagues have commented: "It can be argued that the call-related externalities can easily be internalized since, for instance, the parties to a call are generally either involved in a transaction or engage in reciprocal calling over a given period of time."[34]

V. PLACING CEILINGS ON ACCESS PRICES TO PREVENT ANTICOMPETITVE CONDUCT

Paragraphs 47 and 148 of the NPRM invite comment on arguments that access prices significantly above forward-looking economic (*i.e.*, incremental) cost are anticompetitive. These arguments anticipate the entry of incumbent LECs, or their long distance affiliates, into the provision of in-region, interLATA services. As described in the NPRM, these arguments have two parts. The first part asserts that when access charges exceed incremental costs incumbent LECs and their long-distance affiliates have an artificial competitive advantage. This artificial advantage, so the argument goes, stems from the fact that the true cost of access to the incumbent or its affiliate is the incumbent's incremental cost; while the cost of access for interLATA competitors is the price paid to the incumbent.

The second part of this line of argument contends that LECs could conduct a "price squeeze" if they sell both exchange access and in-region, interLATA services. Implicit in this part of the argument is the notion that incumbent LECs have not only the ability but also the incentive to engage in a such a squeeze. The incentive must lie in the profit produced from driving out established interLATA competitors or deterring potential entrants. One variation on the price-squeeze argument rests on a strategy called "raising rivals' costs." Another variation depends on manipulating the relationship between the

[34] John R. Meyer, *et. al.*, *The Economics of Competition in the Telecommunications Industry* (Cambridge, MA: Oelgeschlager, Gunn & Hain, 1980), p. 103.

prices charged for retail interLATA services and for the exchange access used to produce retail services.

Both parts of the foregoing argument are seriously defective. The notion that LECs have an inherent competitive advantage when selling both local exchange and access services rests on a common fallacy. It ignores the LECs' opportunity costs of foregone access revenues. Professor F. M. Scherer of Harvard's Kennedy School of Government explains the fallacy in this reasoning as follows:

> . . . when a firm sells the same product both externally and to its own internal divisions, the true marginal cost of internal usage is the revenue foregone by not selling additional units to outsiders.[35]

In terms of the LECs and their future in-region, interLATA operations, for every unit of access they use in their own operations or sell to their long-distance affiliates, they would sacrifice the margins over cost that they could earn by selling access services to their interLATA competitors. As an ingredient of a deliberate anticompetitive strategy, the foregone contribution would produce losses for Pacific Bell that it would have to recoup somehow.

Turning now to the price-squeeze part of the argument, incumbent LECs like Pacific Bell have neither the incentive nor the ability to engage in such anticompetitive tactics. Even if Pacific Bell possessed significant market power, it could not successfully squeeze competitors out of the industry. With no prospect of success, Pacific Bell and other incumbent LECs lack the incentive to attempt a price squeeze. In any event, existing safeguards are sufficient to prevent Pacific Bell from imposing a price squeeze on its future interLATA competitors. Moreover, ignoring the lack of incentive and the presence of safeguards, Pacific Bell could not execute a price squeeze because it lacks the requisite market power.

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[35] F. M. Scherer, *Industrial Market Structure and Economic Performance,* 2nd. ed. (Chicago: Rand McNally, 1980), p. 305.

The price-squeeze argument rests on the assumption that Pacific Bell could acquire significant market power over interLATA services (of which it now has a zero percent share of the market). Acquiring such power would be necessary to raise interLATA prices and earn monopoly profits once Pacific Bell has driven out or disciplined its competitors. The prospects of success are not very likely. The RBOCs have not been able to accomplish such feats even in markets where they began with incumbent advantages, such as terminal equipment. In order to acquire market power over interLATA services, Pacific Bell and other incumbents would have to engage in a financially draining price squeeze and possess the staying power to outlast giants like AT&T, MCI (presumably merged with British Telecom) and Sprint, an unlikely possibility.

Moreover, losses from the foregone switched access markups would begin immediately and increase substantially as customers took advantage of Pacific Bell's predatorily low retail prices. In contrast, the profits from raising interLATA prices would not begin until some distant future period. The greater the staying power of the large IXCs, the more distant would be that future period. It is not conceivable that the present value of the unlikely future profits would exceed the present value of the losses.

In the difficult process of capturing large market shares and driving rivals out, consider what would be required in the final phase of an anticompetitive price squeeze. Pacific Bell must be able to raise interLATA toll in this final phase sufficiently to recover losses in the earlier phase. But of course to do this, Pacific Bell must be in a position to have significantly more market power in the interLATA market than AT&T and other IXCs. It is ludicrous to imagine that Pacific Bell could become a significantly larger player in the interLATA market than AT&T is today. Even if Pacific Bell could achieve such a status in the interLATA market and establish such a price increase, it would clearly not be sustainable. Other providers, who had survived under the regime of much lower prices, would quickly shave price and expand to fill the now diminishing share of Pacific Bell.

If a price squeeze cannot bring offsetting monopoly profits in the future, then the profits required to recoup the losses must occur during the same period of time as the squeeze itself. To see why such a prospect is also unlikely, consider a numerical example

of what would occur with a price squeeze. Assume, for purposes of illustration, that the price of access is $0.07, the cost to Pacific Bell of access is $0.03, and therefore the contribution from access is $0.04.[36] Assume further that the additional costs of the provision of interLATA toll service, in excess of the fee paid for access, is $0.02. Therefore, the full cost of providing toll service to an IXC is $.07 + $.02, or $.09. If there are no cost savings from providing toll internally and Pacific Bell is equally efficient in its downstream toll activities, then Pacific Bell has a cost of providing interLATA toll which is also $.09.[37]

In the example above, an anticompetitive price squeeze would require a price for interLATA toll which is less than $0.09; however, such a price is irrational for Pacific Bell. Consider the level of contribution Pacific Bell obtains if it attempts a price squeezing price of, say, $0.085 and captures some minutes which otherwise would have been provided through an established IXC. At the price of $0.085, Pacific Bell's interLATA operations will receive a contribution level of a negative $0.005 (-$0.005), while Pacific Bell's exchange access operations continue to receive a contribution of $0.04. The net contribution to Pacific Bell is $0.04 - $0.005 = $0.035. However, if an established IXC had carried the call, the only sale would be the access sale, and the contribution obtained by Pacific Bell would be the $0.04 obtained in contribution from its exchange access services. Pacific Bell would clearly be better off if it chose some price at or above $0.09 and takes a chance of attracting some customers and generating some level of contribution above the $0.04 in contribution from access. For example, a toll price above $0.09 yields the opportunity for a contribution greater than $0.04 for Pacific Bell while a price below $0.09 drives contribution below the $0.04 level.

In any event, bringing switched access charges closer to economic cost would not guard against anticompetitive price squeezes. As the NPRM seems to realize, an anticompetitive price squeeze arises as the result of the relationship between intermediate

[36] For convenience, all amounts are per conversation minute. The numbers chosen are purely hypothetical.

[37] Implicitly this assumes that there are not economies of vertical integration, coordination or marketing.

good prices and retail prices. The occurrence of a squeeze is not determined by the price of the intermediate good itself.

Professor Alfred Kahn and Dr. William Taylor have correctly and succinctly summarized the connection between the prospects for efficient competition and the level of access charges. Referring to access charges as "interconnection charges," users of exchange access like AT&T and MCI as "non-integrated rivals" and economic costs as "marginal costs," they reach the following conclusion about the level of interconnection charges:

> . . . the *absolute level* of the charge is irrelevant to the ability of the non-integrated rival to compete with the LEC. That ability depends, rather, on the relationship or margin between the interconnection charge—whether high or low, monopolistic or competitive—and the prices at which the LEC offers the competitive service. This is another way of saying that what efficient competition requires is that the non-integrated rival not be subjected to a vertical squeeze, such as was one basis for the condemnation of the Aluminum Company of America (Alcoa) under the antitrust laws. The source of the squeeze was not the absolute height of the price at which Alcoa sold ingot to competing fabricators of sheet but the margin between its respective prices for ingot and sheet. It was the failure of that margin to cover Aloca's own fabricating costs that made it impossible for equally efficient independent fabricators to compete. Whether the LEC's interconnection charge to its local competitors may properly exceed marginal costs, and if so by how much, is therefore essentially irrelevant to the preconditions for efficient competition (emphasis in the original; footnotes omitted).[38]

VI. PRESCRIPTIVE APPROACH TO ACCESS REFORM

A. Estimating the Incremental Costs of Access Services

Section VI of the NPRM observes that AT&T and MCI have submitted computer models purporting to estimate the TSLRIC of retail services and the TELRIC of unbundled network elements.[39] Section VI also mentions that the Commission staff is completing an

[38] Alfred E. Kahn and William E. Taylor, "The Pricing of Inputs Sold to Competitors: Comment," *The Yale Journal on Regulation*, Vol. 11 (1994), pp. 228-229 (emphasis in the original; footnotes omitted).

[39] NPRM, ¶ 220.

analysis of the use of computer models in estimating incremental costs.[40] In addition, I should note that major LECs including Pacific Bell have sponsored similar models. These models have become known generally as cost proxy models. The proxy models include two versions of the Benchmark Cost Model ("BCM"), two releases of the second version of the Hatfield Model ("HM 2.2") and the Cost Proxy Model ("CPM"). The two versions of the BCM are the BCM1 and BCM2, and the two releases of the HM 2.2 are Release 1 ("HM 2.2.1") and Release 2 ("HM 2.2.2"). Pacific Bell, U S WEST and Sprint have recently sponsored a revised model known as the Benchmark Cost Proxy Model ("BCPM").[41]

For estimating costs as a reference for pricing switched access services, the various cost proxy models as they are configured today produce estimates that are inherently inferior to the estimates produced by the standard incremental cost methodology that LECs such as Pacific Bell use. While it is possible for LECs to err in constructing or implementing traditional incremental cost study methods, these traditional methods employ an approach superior to that taken in the cost proxy models. On the other hand, as detailed below, the methodology behind the best of today's cost proxy models, if not the specific results, may be suitable for estimating universal service subsidy requirements or for providing general cost "benchmark" information.

The inferiority of cost proxy model estimates for pricing purposes primarily stems from three sources. First, their various sponsors originally devised the models to estimate the incremental costs of basic local exchange service. The incremental costs of basic local exchange service are highly dependent upon geographic variables, such as customer density and terrain, because they are predominantly made up of local loop costs. Consequently, their sponsors rightly decided to build their models emphasizing the influence of geography and de-emphasizing the influence of other factors. Second, because of de-emphasizing the

[40] NPRM, ¶ 222.

[41] Response of Pacific Bell, U S WEST and Sprint to the Public Notice of December 12, 1996, CC Dkt. No. 96-45, January 7, 1996.

influence of usage, the cost proxy models contain inadequate information on traffic characteristics so very important to determining the level of switched access costs. Third, the various cost proxy models were initially intended to estimate subsidy requirements independent of the company supplying the service.

The cost proxy models' focus on geographic determinants is inappropriate when estimating the incremental costs of switched access services. Switched access services are subject to significant economies of scale with respect to the volume of usage. As the volume of usage rises, the incremental costs of switched access services decline markedly. This dependency on the volume of usage is so strong that it overwhelms the effect of geographic influences. Hence, the design of the cost proxy models emphasizes cost determinants that have little or no impact on the incremental costs of switched access services.

As a result of the models' design, inadequate information regarding usage is included as an input. Because of the scale economies in switched access, reliable traffic forecasts are critical to estimating the incremental costs of such services. The engineering rules of thumb contained in the cost proxy models are insufficient to the task. Lacking accurate traffic forecasts or a design that realistically incorporates the impact of usage volumes, the cost proxy models are very likely to underestimate the incremental costs of switched access.

It is also extremely important to recognize that the various cost proxy models were originally devised to estimate subsidies, not compensatory prices. Hence, the models attempt to represent the costs of LECs differing greatly in size, using a different mix of technology, and serving vastly different geographic areas. The importance is that the technology choices and facility mixes embodied in the models often do not correspond to the actual choices and mixes of particular LECs. Technology choices and facility mixes have a significant impact on required investment levels, especially for providing customer access. For example, the impact of these choices is reflected in the selection of the crossover point for use of electronic facility provisioning and in the placement costs which the companies incur (e.g., burying cable in some densely populated areas may be

considerably more costly than placing aerial facilities). When estimating costs for pricing purposes, the economically preferred method is to reflect as closely as possible the actual choices faced by engineers in placing relevant facilities.

In summary, when the objective is obtaining a cost reference for pricing access services, accurate traffic forecasts and company-specific cost information are required, and traditional LEC incremental cost studies should be performed. When obtaining more general cost information about the need for subsidies in particular geographic areas is the objective, proxy models may provide a cost effective way to obtain such information.

B. TSLRIC Pricing Methodology

When discussing its prescriptive approach to access pricing, the NPRM's Section VI seeks comment on rules designed to drive interstate access rates to TSLRIC levels.[42] I take this request to mean that the Commission wants comment on rules forcing the prices of access services to equal TSLRIC. Promulgating such rules would be an enormous mistake. First, as I have already discussed, incumbent LECs must recover common line costs through access charges, unless the Commission increases the SLC. Second, incumbent LECs must also recover unattributable shared and common costs throughout the full array of their services, including exchange access, unbundled network elements and other interconnection services. Finally, incumbent LECs must recover through access and interconnection charges the costs that they have prudently incurred in fulfilling their public service obligations, including depreciation reserve deficiencies and stranded costs.

Traditional total service long-run incremental cost ("TSLRIC") estimating procedures result in shared and common costs which cannot be attributed to individual services. For LECs like Pacific Bell, the amount of these shared and common costs is very significant. Although total element long-run incremental cost ("TELRIC") methodology may attribute a greater amount of these costs, there is no doubt that there will still be a

[42] NPRM, ¶ 222.

significant amount of shared and common costs which will not be directly attributable to network elements. The actual amount of unattributable shared and common costs will depend on how network elements are defined.

The greater the efficiencies of sharing facilities and costs, the larger the shared and common costs of the firm, and the greater the need to set prices in excess of TELRIC.[43] In other words, such increased efficiencies will reduce incremental costs but increase shared and common costs. However, these shared and common costs must be recovered for a firm to remain in business.

The increased efficiencies from sharing facilities and costs is desirable for the firm and society. However, these costs must be recovered from the services which the firm provides, including intermediate services. Prices for intermediate services no higher than TSLRIC do not allow for the recovery of the shared and common costs which are beneficial to society and are not consistent with the competitive process.

Competition tends to drive prices to a point where all valid business costs are just recovered. Shared and common costs are valid costs of business. When competition drives prices toward costs, these shared and common costs are a component of the costs a provider must recover, even in the most competitive of markets.

In a competitive environment, every product must be allowed to make a sufficient contribution to help recover the shared and common costs of the firm. Many firms strictly offer business-to-business services, i.e., they only offer intermediate products or services to other firms and do not sell to end-users.[44] Many of these firms may have substantial shared

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[43] The efficiencies due to sharing facilities and costs in the provision of multiple services are sometimes called economies of scope. This is similar to, but may be distinct from, the concept of economies of scale which reflects cost savings from large scale production of a particular (a single) product or service.

[44] Catalogs and directories exist for "business-to-business" products and services; many of these products are used as components or inputs to produce products for final consumers. Some of the firms which are largely or completely intermediate-products firms are obvious and well known such as Intel, Boeing, McDonnell-Douglas, U.S. Steel, Alcoa Aluminum, or Peabody Coal. However, many other firms which one might consider as final goods producers, such as Beatrice Foods, Detroit Diesel, Kellogg, Phillip Morris, Proctor & Gamble, or Frito Lay, provide relatively few, if any, products to end users. These firms rely on other firms to actually provide products to end users. Certainly, any firm which only provides intermediate services must recover all of its shared costs from those intermediate services.

and common costs which must be recovered from the prices of the intermediate products or services which they sell to other firms. In general, firms in real markets selling intermediate services have shared and common costs which must be recovered through the prices of the intermediate products or services which they sell to other firms. It is obvious in these instances that providers must obtain a sufficient contribution from each intermediate service or they will be unable to continue in business.

VII. TRANSITION ISSUES

A. Recovery of Embedded Costs

Firms in competitive industries may, at any point in time, price services above, below, or equal to their embedded costs or historical costs. Competitive firms will always price services at or above forward-looking incremental costs, but the degree to which prices exceed incremental costs will be based on market considerations at the time.

Clearly, firms on average must recover their historical costs and earn a normal accounting profit (a zero economic profit). No firm would willingly enter an industry or produce a particular product if it expected that it would not recover its investment. Competitive market forces often cause some firms in an industry to sustain losses and go out of business. At the same time, other firms in the industry may earn above-average accounting profits (positive economic profits). In fact, competitively determined prices cover the full costs of the *least* efficient surviving firm in the industry. This marginal firm will just barely earn a zero economic profit and stay in business in the long run.

"Profit" is by nature a residual concept. It is what is left over after all costs have been paid; it is the margin by which total revenues exceed total costs. On average, firms must expect to earn at least an average accounting profit, or firms will not enter an industry or remain in it. In other words, on average firms must recover their historical costs.

Logically, to take regulatory action which would preclude a firm from recovering its historical costs would seem to require a significant probability that under different circumstances the firm would have been allowed to earn a profit much greater than average. In particular, it would seem that one must carefully consider a regulatory policy which precludes recovery of historical costs, when absent regulation, the firm would have a reasonable opportunity for recovery of such costs.

B. Recovery of Depreciation Reserve Deficiency

Both the harm caused by using prescribed depreciation lives to set rates and the impractical nature of such a practice in a competitive environment can be best understood by examining past practices with respect to depreciation policy. In a monopoly environment with telephone companies subject to rate of return and revenue requirement forms of regulation, such a practice was useful in maintaining low basic exchange rates. For example, think of the prescribed depreciation life as a "time payment plan" for a monopoly telephone company's capital investments. Long time payment plans imply low annual or monthly payments, while short time payment plans involve higher annual and monthly payments. So long as there was no effective competition, and so long as the time payment plans were completed, the revenue requirement process would assure that the local telephone company would receive both a return of and a (prescribed) return on its capital investments. Regulatory accounting practices insured that this would be the case by allowing for depreciation reserve deficiencies.

A depreciation reserve deficiency is represented by the undepreciated portion of an asset at the time that the asset is taken out of service or is no longer useful. If depreciation lives were prescribed to be longer than the useful life of the asset, the undepreciated portion of the asset was left in the rate base. Thus, the regulated books of the local telephone company would consider the reserve deficiency to be a (financial) asset of the company on which earnings would still be allowed in a revenue requirement. This would be true even if the asset were no longer useful or even continued to exist. Indeed, at the time of divestiture AT&T's reserve deficiency was well over $20 billion. This means that

depreciation lives had been prescribed to be excessively long on average at that point in time.

The problem with continuing this practice today is that it may be both anticompetitive and unsustainable in a competitive environment. The practice is potentially anticompetitive because the local telephone company would be underestimating its costs when using excessive prescribed depreciation lives. By overestimating depreciable lives, and hence underestimating costs, rates may appear to be in excess of costs and yet be anticompetitively low (as compared to prices reflecting economic depreciation lives and economic costs). The practice is unsustainable because competitive marketplaces set prices based on the cost of competitive entry (using current and forward-looking technologies) rather than book costs carried over from incorrect previous depreciation practices. In the end, a firm must survive by receiving positive cash flows which exceed the negative cash flows of the firm. Properly prescribed economic depreciation lives match the expenditure on a capital asset with its opportunity to receive net revenues (revenues in excess of the operating and maintenance expenses associated with the capital item). This compels competitive firms to use economic depreciation lives in setting competitive prices. So should it compel the Commission in this instance.

C. Stranded Cost Recovery

Stranded costs are those costs which incumbent LECs incurred under past regulatory pricing and entry policies, but whose recovery may be precluded from the ensuing competition in the local exchange market. The costs of stranded investments are a result of the franchise monopoly agreement under which Pacific Bell and other incumbent LECs operated for most of their history. In order to keep basic rates inefficiently low, depreciation lives were artificially extended beyond the economic lives of the investments. Furthermore, regulators ensured that the rate of return experienced by Pacific Bell and other incumbent LECs did not exceed near riskless levels. Hence, the return promised to investors was not allowed to be large enough to compensate for the risk of long